



**UNITED STATES DEPARTMENT OF COMMERCE  
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SERIAL NUMBER: 08/356,229 FILING DATE: 12/19/94 FIRST NAME: NILSSON

18M1/0429

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1802

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DATE MAILED: 04/29/96

This is a communication in connection with the application for a patent.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 12-19-94 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 3 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

**Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892.        | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948 |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449   | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152       |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/>  |

**Part II SUMMARY OF ACTION**

1. ☒ Claims 1-16 are pending in the application.  
Of the above, claims \_\_\_\_\_ are withdrawn from consideration.
2. ☐ Claims \_\_\_\_\_ have been cancelled.
3. ☐ Claims \_\_\_\_\_ are allowed.
4. ☒ Claims 1-16 are rejected.
5. ☐ Claims \_\_\_\_\_ are objected to.
6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed \_\_\_\_\_, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closer in accordance with the practice under Ex parte Quayle, 1935 C.D. 11: 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

### **Part III DETAILED ACTION**

#### *Specification*

1. This application does not contain an Abstract of the Disclosure as required by 37 C.F.R. § 1.72(b). An Abstract on a separate sheet is required.

#### *Claim Objections*

2. The claims are objected to because they lack a proper introduction. The present Office practice is to insist that each claim must be the object of a sentence starting with "I (or we) claim", "The invention claimed is" (or the equivalent). MPEP § 608.01(m).
3. Claims 6 and 10 are objected to because of the following informalities: in claim 6, "alifatic" is misspelled and in claim 10, "ellipsometri" is misspelled. Appropriate correction is required.
4. Claims 1, 2, 8-10, and 12-13 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the phrase "with ability to bind" is vague and indefinite. It is suggested that the phrase be replaced with "which specifically binds".

In claims 2, 8, 9, and 12, it is unclear whether "a surface" refers to the same surface recited in claim 1 or another surface of the biosensor.

In claim 10, the phrase "biosensor use" is confusing.

In claim 13, it is unclear whether "a gold surface" refers to the same surface recited in claim 1 or another surface of the biosensor.

#### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 9, 10, 15, and 16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Attridge et al. (WO 90/01166; cited by applicant).

Attridge et al. disclose an optical sensor comprising a ligand immobilized on a gold surface for use in the detection of a protein, virus, or cell which is bound by said ligand.

The ligand may be a specific carbohydrate. Surface plasmon resonance is used to measure

binding on the gold surface. See p. 5, lines 1-4 and 20-30, p. 13, line 31 to p. 15, line 16, p. 16 lines 3-12, and Table 1.

7. Claims 1, 2, 11 and 16 rejected under 35 U.S.C. § 102(b) as being anticipated by Karube (EP 0215669; cited by applicant).

Karube discloses a piezoelectric crystal biosensor having immobilized thereon a receptor material for the detection of microbes and cells. The receptor may be a sugar (i.e. carbohydrate). See p. 3, lines 3-15 and p. 6, lines 15-28.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56

to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

9. Claims 3-8 and 12-13 are rejected under 35 U.S.C. § 103 as being unpatentable over Attridge et al. in view of Nilsson et al. (U.S. Patent 4,918,009; cited by applicant) .

Attridge et al., disclose a biosensor comprising a gold surface-immobilized carbohydrate for detecting a protein, virus, or cell, as discussed above. Attridge et al. teach that specific carbohydrates may be used as the biosensor receptor to bind lectins specific for the carbohydrate. Attridge et al. do not teach the specific carbohydrate derivatives recited in the instant claims. Nilsson et al. disclose a large number of carbohydrate derivatives which meet the limitations of the instant claims. Please see the following locations in the reference which teach the carbohydrate derivatives of the instant claims: col. 3, line 49 to col. 4, line 14; col. 4, lines 51-53; col. 5, lines 46-55; col. 6, lines 4-21; col. 6, line 67 to col. 7, line 2; and col. 8, lines 64-66. Nilsson et al. teach that many of the carbohydrate derivatives are specific for various bacterial lectins and suggest their use in diagnostics (see col. 1, lines 29-31; col. 9, lines 9 -19 and the tables in columns 10-14) and teach that they may be immobilized on solid carriers (col. 7, lines 26-29; col. 15, lines 10-13; col. 20, lines 34-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made, absent unexpected results, to use the specific carbohydrates and derivatives thereof disclosed by Nilsson et al. as the immobilized ligands in the biosensor of Attridge et al. because Attridge et al. teach using the biosensor to detect lectins and microbial cells which

are bound by the immobilized specific carbohydrate and Nilsson et al. teach that their carbohydrate derivatives may be immobilized on solid carriers and used in diagnostic methods.

10. Claim 14 is rejected under 35 U.S.C. § 103 as being unpatentable over Attridge et al.

Attridge et al. disclose a biosensor comprising a gold surface-immobilized ligand (e.g. carbohydrate), as discussed above. Attridge et al teach functionalizing the gold surface in order to facilitate coupling of the ligand to the gold surface (see p. 21, lines 17-19). Attridge et al. fail to teach coating the gold surface with a thiol compound through which the ligand/carbohydrate is immobilized. It would have been obvious to one of ordinary skill in the art at the time the invention was made, absent unexpected results, to coat the gold surface in the biosensor of Attridge et al. with thiol compounds through which the carbohydrate ligand can be immobilized because various methods of coupling biological ligands to solid surfaces, including using thiol compounds (e.g. SPDP linker) are well known in the art, as indicated in the instant specification at page 5 (4th paragraph), and would be equivalent methods of immobilizing reagents to the biosensor surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad Murthy whose number is (703) 308-7544. The examiner is available Monday through Thursday, between 7:30 AM and 5:30 PM. If the examiner is unavailable, inquiries should be directed to the examiner's Supervisory Patents Examiner, James Housel, who can be reached at (703) 308-4027.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Papers related to this application may be submitted to Group 180 by facsimile transmission. The faxing of such papers must conform with the notice published in the

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Art Unit: 1802

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Official Gazette, 1096 OG 30 (November 15, 1989). The fax number of Art Unit 1802 is (703) 308-4065.

*Prasad Murthy*

Prasad Murthy  
April 26, 1996

*James C. House*  
JAMES C. HOUSEL 4/29/96  
SUPERVISORY PATENT EXAMINER  
GROUP 180